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SHORT REPORT

Estimation of stature from handprint dimensions – Positional variations in real crime scene situations

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Abstract Estimation of stature from handprints/palmprints recovered at the crime scene may help in the identification of the criminal/perpetrator. The present communication is an advisory on the recently published studies regarding stature estimation from different dimensions of handprints in various populations. We emphasize that at the crime scenes, the prints of the hands are usually found in a way that the fingers are apart from each other that may or may not be fully stretched or in any other working position of the hand; and rarely similar to the position described in studies as a non-stretched normal position with all the fingers joined with one another except for the thumb. The communication further stresses on the need for further studies on hand prints describing various positional variations pertaining to the practical forensic situations especially when the prints are taken in stretched/flexed/extended positions of the hand.

1. Introduction and background

Fingerprints, handprints and footprints are usually encountered at the crime scenes which help in the identification of the criminal/perpetrator. For identification purposes, the comparison of the crime scene prints with those of the suspects is an essential part of forensic casework. However, in many such cases, the investigating officer seems helpless for the lack of data for comparison. In these cases, any clue regarding the biological profile of the criminal may aid the investigation in the identification process. The estimation of the biological profile of the criminals from the prints left at the crime scene may further narrow down the possible pool of suspects. The estimation of stature is an important parameter in establishing the biological profile of the deceased that may prove useful during investigation of crimes where impressions of some body parts such as hand and foot-prints are available for examination. A

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Figure 1 Handprints having the fingers apart from each other and fully stretched–one form of handprints usually encountered at the crime scene.

number of studies are available on estimation of stature from footprints and shoeprints as these are often recovered at the crime scenes. On the other hand, the studies on handprints/palmprints are scanty; which may be attributed to their flimsy presence at the crime scene and thus, its limited utility in a practical scenario. A study by Jain and Feng[1] showed that about 30% of the latent prints recovered from the crime scenes are from palms. Hence, there is a need for establishing forensic standards and databases in different populations for estimation of stature and sex from handprints/palmprints.

2. A short review of studies related to estimation of stature from handprints

A search on the PUBMED revealed three recent studies on the estimation of stature from dimensions of handprints/palmprints published in *Forensic Science International, Journal of Forensic Sciences* and *Journal of Forensic and Legal Medicine*. Ahemad and Purkait[2] devised a new methodology for estimation of stature from hand impressions after conducting a study on 503 males of central India. They discussed some methodological issues related to the depressed area between the hypothenar and thenar regions of the hand impressions and bracelet crease. Ishak et al.[3] established stature estimation from dimensions of hand and handprints in 91 male and 110 female adult individuals of Western Australian population. They found an accuracy of ± 4.74 to 6.53 cm in stature estimation from hand and handprints. The third study is a recent one conducted by Paulis[4] who took measurements on hand prints of 100 males and 91 females of an Egyptian population. He devised linear and multiple regression equations from various measurements of the handprints and established stature estimation standards for Egyptian population. Ahemad and Purkait[2] used a simple manual method of taking handprints after application of ink on the hands, however, Ishak et al.[3] and Paulis[4] used a software program for scanning the hand and processing the image for taking various measurements instead of manual measuring techniques.

3. Real crime scene situations

At the crime scene, the hand/palmprints may be available in the form of latent prints (prints which are not visible to the naked eye, however can be developed by applying some powders and chemicals) or in the form of inked impressions left by the criminals and burglars. In these circumstances, the prints of the hands are usually found in a way that the fingers are apart from each other that may or may not be fully stretched as have been taken by Ahmed and Purkait[2] (Fig. 1) or in any other position such as opening the lock of the almirah/refrigerator or holding a stick while assaulting/attacking somebody when the hand's position can be described as bent, arched, loosened or any other working position of the hand (Fig. 2). However, the handprints may rarely be similar to the position as shown by Paulis[4] and Ishak et al.[3] in their studies as a non-stretched normal position with all the fingers joined with one another except for the thumb (Fig. 3). The prints described in their research may be obtained in rare circumstances when the criminals touch a table, refrigerator or other flat objects precisely and exactly in the same position. In most cases the prints at the crime scene are available in the latent form. Instances of such hand prints are presented in the real forensic cases.[5–8] In these situations, it is very difficult to take the measurements on the hand prints and consequently, the estimate of stature becomes problematic.

Figure 2 Hand/palmprints may be impressed on the surface/objects while opening a bottle/almirah or holding a stick etc.

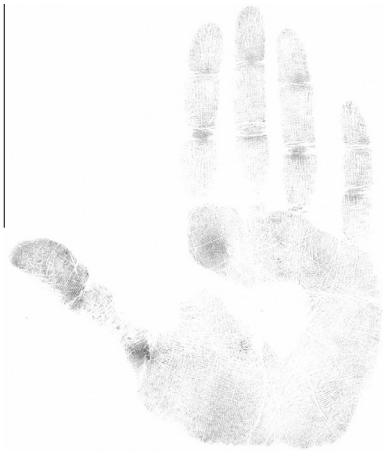

Figure 3 The print of the hand when all the fingers joined with one another except for the thumb.

The communication is an advisory on the recently published studies regarding stature estimation from different dimensions of handprints in various populations. It further emphasizes on the need for more elaborate studies on hand prints describing various positional variations pertaining to the practical and real forensic situations especially when the prints are taken in stretched/flexed/extended position of the hand.

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Conflict of interest

The authors declare that there is no conflict of interest regarding this manuscript.

Informed consent

None declared.

Ethical approval

None declared.

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